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ABSTRACT

The word-identification approach has long been the basis for teaching reading in both native and second languages. Recent work has a new approach, particularly that of Frank Smith, who developed a feature analysis model of reading. As we can identify letters in different configurations or before all the strokes are completed, so can we identify words before all the letters are filled in, and comprehend sentences and paragraphs even if some words are left out. The process of reading consists of reducing uncertainty about a text by assigning the various configurations to mental or semantic categories established during the acquisition of language. Feature analysis is consistent with speed reading, as a person uses the redundancy of the text and finds predictive features to extract information from a text quickly. A project at the Macalester English Language Institute in 1975 used feature analysis to train Iranian students to develop English reading skills and speed by reading for specific letters or words, or to find answers to certain questions. Further research is suggested in: the affective domain of language learning, grammar and reading, and testing reading skills. (CHK)

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FEATURE ANALYSIS AND THE TEACHING OF READING

Karl Sandberg

How should we set about to teach reading either in the native or a foreign language?

We should first consider William James' dictum that the most important thing for a landlady to know about her tenants is not their bank account but their philosophy. Without a strong theory of reading, a model which will account economically for all the phenomena of reading per se and will give a description of what happens inside when someone reads, we have no effective means of informing a strategy or organizing techniques into a course sequence.

Now what is striking in the summary which Chall did of the "great debate about reading" (Chall, 1967) is the absence of strong theory to describe the process of reading, or to account for such related phenomena as rapid reading (up to ca. 5,000 words a minute). What we do find is a set of unspoken assumptions that reading is a word-centered process and that if the learner learns enough words, he will know how to read. The degree of skill in reading is tacitly equated with the number of words that can be identified and the process of learning to read is equated with learning how to identify words. Certainly the word identification approach has been generally prevalent in foreign language teaching, and the text format in almost all reading texts has been built upon the glossary rather than upon teaching techniques of reading.

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The work of a few people, such as Russel Stauffer (Reading as a Thinking Process, 1969), and Evelyn Wood in teaching reading to native speakers, coincides with theoretical models of reading prepared by psycholinguists such as Frank Smith and Aaron Carton and points to some new and fruitful approaches. In particular, Frank Smith's development of a feature analysis model of reading (Understanding Reading, 1971) has attracted a good deal of attention in the field. I would like to describe this model and to set down some of its implications and possible applications to the teaching of reading both to native and non-native speakers.

The work of Smith draws heavily on and continues work done over a long period of time in communications theory and generative grammer. The work of Cherry (1966), for example, codified much feature analysis algebraically and the work of Miller (1967) provides much of the groundwork for a feature analysis model. What Smith does is to focus the theory on reading and present it clearly and engagingly. He limits himself to the theory, however, and leaves the pedagogical implications to be worked out.

In order to grasp feature analysis theory let us begin by asking on what basis we identify individual letters. If we see the configuration | and ask what it is going to be, we have several possibilities, such as b, d, h, i, J, k, l, M, N, r, B, P, . If we see it as r, we can eliminate all the possibilities except b, h, k and perhaps r. During our acquisition of English we have established a mental category,

grossly analogized by a filing drawer, for "k", another for "b", etc. to which we assign several different ink marks or configurations, such as K, K, k, k or B, b, b, B. When we see the configuration as we assign it to the category "k" on the basis of seeing some distinctive parts of it and checking them against some kind of feature list we have established "in there." We should also note that after we see , the rest of the information that we pick up by seeing is redundant. (Smith, pp. 105-121)

We may use the same process in identifying words. At what point do we become sure of the identity of these words? p_____d, p___ nd, po_nd, pound. Or b_____y, bi_____y, bi_____phy, bio___phy. Most readers do not need to see all of the letters in order to eliminate any doubt they have about what the word is. Nor is the following beyond their ken, even though only one half of each letter is visible.

~~ALTHOUGH RUSSELL'S OWN TATTERED HUMANITY CANNOT BE EXPLAINED BY SIMPLE REFERENCE TO CHILDHOOD DEPRIVATION, IT IS CLEAR THAT GROWING UP WITHOUT THE LOVE OF PARENTS OR EVEN THE COMPANIONSHIP~~

We may conclude that just as we have established categories for "k" and "b", we have also established a category for "pound", for example, to which it is possible to assign various visual arrays, such as *pound*, pound, POUND, PoUnD, and lb. on the basis of partial information given by distinguishing traits or features. More specifically, we predict on the basis of partial, distinguishing traits what we are going to

find, and we then set about looking for information which will verify or correct the prediction. (Smith, pp. 123-148)

Do we use the same procedure in reading sentences and meanings? We need only examine our own reaction to the following examples from which words have been periodically omitted:

. Mark Twain [redacted] remarked that "[redacted] great books [redacted] the books [redacted] everyone wishes [redacted] *had* read, [redacted] no one [redacted] to read." [redacted] wish they [redacted] read them [redacted] they are [redacted] indispensable material [redacted] a liberal [redacted]. They shy away [redacted] reading them because [redacted] books require thought. [redacted] thinking is hard. [redacted] is probably one [redacted] the most painful [redacted] that human beings [redacted] called upon to [redacted].

. Like all the other good [redacted] in life, what the [redacted] books have to offer [redacted] hard to get. But [redacted] is precisely because great [redacted] are difficult that they are [redacted] readable and more worth [redacted] than other books. It is [redacted] because they raise problems [redacted] they do not finally [redacted] that they can provoke [redacted] to think, inquire, and [redacted].

We do not need to see all of the words in the passage in order to reduce our doubt and hesitation about what it means. On the basis of what we do see, we form some kind of hypothesis about the missing word, phrase or meaning and then look for other clues which will confirm or correct the hypothesis (Smith, pp. 185-210).

The number of words that can be left out of a sentence without impairing its intelligibility depends on the reader's familiarity with the subject and also upon the amount of redundant information in the text -- all texts are not the same in this respect. Nonetheless, redundancy seems to be a characteristic of human language (as opposed to computer

language) and to the degree that we are able to take advantage of a redundancy, we are able to read the whole by means of a limited number of parts.

At this point we can give a general description of a feature analysis model of reading. It holds that the process of reading consists of reducing uncertainty about a text by assigning the various configurations to mental or semantic categories which we have established during the acquisition of language. By picking out certain distinguishing traits or features of the text, we make an initial prediction of what we are going to find out about letters, words, sentences, or whole meanings, and we then look for information which will confirm or correct our prediction without necessarily processing every bit of information available. Reading then is not a passive but an active skill (Smith, p. 69). The reading process is one of hypothesis confirmation. Reading is predicting and proving, asking questions about the text and finding the information which answers them.

Feature analysis thus provides an interesting alternative to the claim that it is impossible to "read" more than 900 or 1000 wpm because it is physiologically impossible to process the information faster than that. In a feature analysis view, when a person reads 10 pages a minute, each page containing 250 words, it may not be strictly accurate to say that he reads 2500 wpm, but neither is the reader merely skimming. Rather, we may say that such a reader knows how to make sufficiently good use of the redundancy of the text and has become suf-

ficiently skilled in finding the predictive features that within one minute he has extracted the information expressed in 2500 words.

We may carry the implications of these notions further. Language learning is not a matter of habit formation but rather a matter of finding the basis for prediction in a novel situation. And word identification, though often a part of the reading process, should not be thought synonymous with the reading process, which is a skill different from that of being able to recall a corpus of material.

Continuing to follow Smith's model, we find that the way the brain works in reducing uncertainty about the text will lead to other generalizations about reading. In interpreting and categorizing stimuli, there is a three-stage progression from the sensory store through the short-term memory to the long-term memory. A stimulus can be held in the sensory store for about 50 msecs, and if not transferred to the short term memory, it is lost. It can be held in the short term memory a maximum of about five seconds, and then is lost if not transferred to the long term memory. During this process the brain does not process and classify all of the stimuli which assail the eyes and ears at every moment. The eye is not the peer of the brain: it does not transmit whole images which the brain classifies according to matching templates. Rather, the brain is purposive, predictive, and selective and is constantly telling the eye what to look for, making perception dependent upon the intention of the brain. In this process the brain is

doing at least two things: (1) reducing the plethora of sensations to as big chunks as possible, e.g. making three big chunks out of the several little chunks of a telephone number as 7934561 becomes 793/45/61, and (2) looking for the features either in word or context which will enable it to predict which category a word or phrase or meaning will go into and then verifying its prediction. If the brain does not receive this confirming information quickly, the stimulus starts to fade and there is a log jam (Smith, pp. 90-94).

Three cognitive factors thus play a determining role in the reading process: (1) a good reader has to be fast, simply because of the limitations on the short-term memory; (2) the reader has to be selective, choosing only the most important information; (3) the most effective reader is the one who is best able to utilize prior information to process new information in larger and larger units, because he cannot hold more than four or five units in the short-term memory (Smith, pp. 93-94).

As the picture of the reader as predictor starts to emerge from this psycholinguistic analysis of reading and as we pass from theory to practice, we should observe that the reading practitioners have not attended upon the linguistic theoreticians. Stauffer's work (1969) in teaching reading to native speakers emphasizes the importance of always reading for a purpose. The approach used by Evelyn Wood includes a preview and a postview. The SRA materials make use of the reading survey, as do a number of other approaches. They all have in common that it is

a valuable, even necessary part of reading to find out in advance what it is that we should look for while reading. And all courses in reading improvement make use of some kind of eye pacing techniques.

There is of course much more to this model of reading than I have mentioned. Those interested in elaboration of it or in critical analysis of it should consult Smith's work and the many references which he gives. Of more interest to the teacher of reading in a foreign or the native language is the question which Smith does not go on to answer: if we assumed the model to be correct, how would our course strategies and classroom techniques be different? How should we set about to teach reading? Since this model is based upon basically different assumptions about the processes of the mind and the nature of language than have been prevalent in the profession for many years, the elaboration of all of its implications would require volumes.

As an example of the many possible directions potential in this view of reading, I will report the experience last summer (1975) at the Macalester English Language Institute, which provided the occasion for drawing some of the old techniques together in light of the new theory. The task was to take a group of Iranian students who had had a foundation course in English structures and basic vocabulary and develop their reading skills and speed to the point where they could do the reading for a series of technical courses. We started with the assumption that in learning to read, a large vocabulary

is best developed in context by reading widely in subject matter which is conceptually familiar to the students in their own language and that the first step therefore ought to be increasing the reading rate from the initial 80-100 wpm to 300-500 wpm to enable them to do this much reading. About half of the group responded well to conventional eye pacing techniques and were soon reading small books within the class period or overnight and were making corresponding gains in their competency in English. The others resisted the pacing techniques and protested that they could not read fast and understand at the same time. As a result we developed the following strategy for increasing both rate and comprehension.

From the beginning, train the students in the techniques of looking for specific information. In the beginning stages, this purpose is supplied or designated by the teacher in a series of exercises:

1. Read for a specific letter.
   Prepare a list of some thirty words from the target language. Simply ask the students to tell you how many words begin with s, for example, or with p, or how many end with r or t, or some other letter.

2. Read for a cluster.
   Using the same list, ask how many words begin with sh-, gr-, cr-, or str-, or how many end with a particular cluster.

3. Read for a word.

   Taking a normal paragraph in which two or three words occur more than once, ask the students to read the paragraph and tell you how many times the word occurs.

These first three steps have proved to be especially valuable in breaking the students' habit of deciphering by teaching them to look for something specific. After they have done the exercises, it can be pointed out to them that when they know what to look for, they really can get this information at the rate of 300-500 wpm.

4. Read for a fact.

   Choose a paragraph containing factual information. Precede the paragraph by a multiple choice question, and ask the students to find which answer is correct.

Students can in fact begin this reading activity as soon as they have even a small grasp on the structures of the language.

The next stage is to <u>teach the students how to formulate their own questions</u>.

5. Read for a question.

   Choose a passage of six or seven paragraphs, and blot out all but the first line of each paragraph. Have the students read the first line of each paragraph in order to predict what the passage is ? about?

6. Read for an answer.

   Give the students the entire passage and have them find the answers to their questions.

The effects of this approach are many. As reading becomes more purposive, the reading rate increases, which in turn tends to increase comprehension. The dynamics of the classroom become less centered on the teacher and more on the students and their mental contribution. The source of motivation thus starts to come more from within than from without. This one sequence is merely illustrative of the many implicit in a cognitive model.

Finally, this model of reading and its attendant view of language suggest the need for research and elaboration in three areas.

The first is the affective domain of language learning. If the process of reading inevitably involves prediction and risk taking, the student's performance in reading will never exceed his willingness to take risks. The affective factor of classroom attitudes toward error may turn out to play a much greater role in learning to read than is usually supposed.

The second is in the concept of grammar. If we conceive of features as those regularities of language which enable us to predict what we are going to find, we can see after a short investigation that many of them, perhaps most of them, are not described in the texts which we give students to learn language from. To extend these concepts into the teaching of reading,

we would have to extend and enlarge our notions of grammar.

The third area is in testing. If the process of reading consists of the student forming and answering his questions about the text, it may be that we would do well to re-examine the premises of testing procedures which ask the student to answer a set of somebody else's questions and then attempt on that basis to quantify the student's reading performance or competence, saying that he reads with 60% or 80% comprehension. Although such procedures will indeed measure how many of the teacher's or tester's questions the student can answer, they leave unmeasured how much the student has understood but has not been questioned on. The development of Cloze procedures in testing represents an effort to include the student's own predictive and analytic ability in the measure of reading performance (Taylor, 1957).

I will conclude by returning to the original point about philosophy and bank accounts. The "bank account" is the concern for the practical, for the techniques, for "what we do on Monday." The philosophy is the theory which organizes and gives direction and purpose to the techniques. Without the techniques, theory remains sterile and contemplative. And without the direction given by strong theory, the interest in techniques may simply turn into tinkering and bustle. The feature analysis model of reading which I have described is simply a part of a larger theoretical construct of the cognitive aspects of language and language learning which, as they are followed to their implications, may prove in their generality

and abstractness to be among the most eminently practical notions in the teaching of reading.

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